



AUS
SEABED

News

AusSeabed Newsletter No. 34 February 2023

Dear AusSeabed Community

Happy New Year!

Welcome to 2023. I hope that you have hit the ground running just like the AusSeabed team has this year!

We started off this year releasing our Quarterly Report, and saying bon voyage to the RV Investigator as it headed down to Antarctica. Jump down to our reading corner to hear more about what the team on the RV Investigator got up to on their voyage.

CMDR Nigel Townsend,

AusSeabed Steering Committee Chair

Newsletter in a nutshell...

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- Showcasing Collaborative Seabed Efforts: March community webinars
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- Big Ships with big anchors and big chains
- Transit mapping across the Great Southern Ocean; geomorphic insights
- New bathymetry compilation from seismic data
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- Australian Hydrographic Society Education Award
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 - World Hydrography Day 2023 + AusSeabed Annual Workshops: 21 June, Wollongong NSW
 - Australian Hydrographic Society Webinars and Networking: 30 March, Perth
 - GEBCO Webinar Series on Improving discovery and access to bathy data: 27 Feb, Virtual
 - Association of Public Authority Surveyors Conference 2023: 20-22 March, Coffs Harbour NSW
 - EGU Annual Meeting 2023: 23-28 April, Vienna Austria
 - GeoHab 2023: 8-12 May, La Réunion Island
 - Locate 2023: 10-12 May, Adelaide SA
 - AMSA 2023: July 2-7, Gold Coast QLD
 - SOOS Symposium 2023: 14-18 Aug, Hobart TAS

Update on AusSeabed

Our quarterly showcases provide a chance for us to show the AusSeabed community what we have been working on in the last quarter and reflect on what was. Based on our progress we offer the community our goals for the next quarter against our project objectives. Our recent (Feb 16th) quarterly showcase is now available to view online on the [AusSeabed YouTube playlist](#). The **next AusSeabed Quarterly Showcase will be held on the 17th of April at 11am AEDT.**

Our recent [Quarterly Report](#) is now available to read online. The reports include an update on the general activity of AusSeabed Program, as well as a statistics report that includes key information on the uptake of our products and the delivery of services.

Showcasing Collaborative Seabed Efforts: March community webinars

On March 23rd at 11am – 1pm AEDT we will hold another series of community webinars. This series will feature the following presentations showcasing current collaborative community efforts being undertaken. Watch out for an agenda to come via our distribution list.

New data on the Data Portal

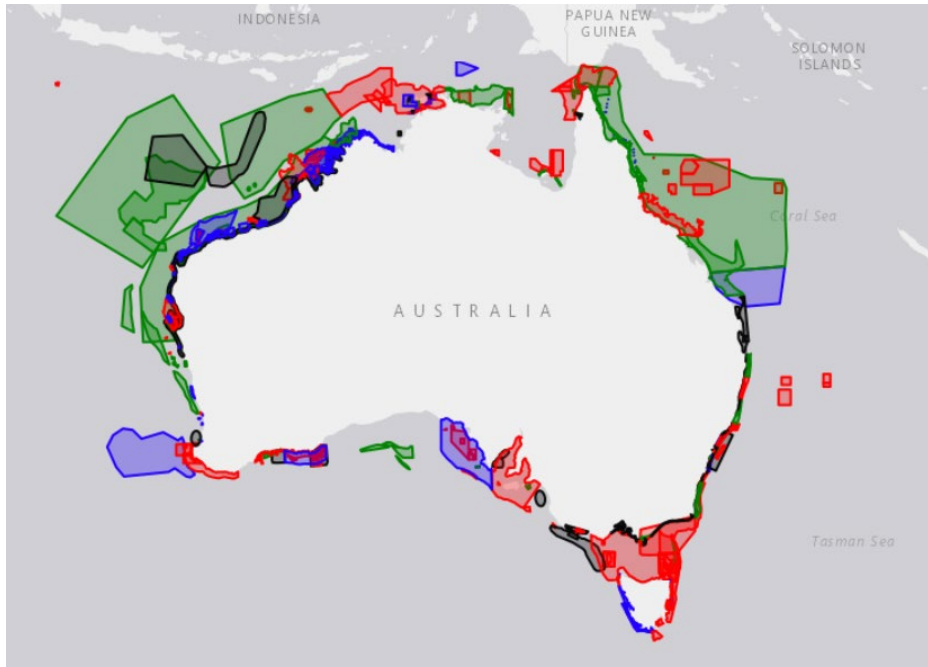
- [Peterborough to Port Fairy 2018 2m](#)
- [Apollo Marine Park Bathymetry 2020 2m](#)
- [Southeast Tasmania and Southern Macquarie Ridge \(AUSTREA2\) Bathymetry 2000 120-440m](#)
- [Bonaparte and Browse basins 3D Seismic derived bathymetry compilation 2022 30m](#)

Contribute your National Areas of Interest

We thank those who have contributed to the AusSeabed National Areas of Interest map by submitting prioritized polygons. The usefulness of the AusSeabed Survey Coordination Tool (SCT) as a central location for planning of mapping activities is dependent on up-to-date information. For that reason, we are reaching out to contributors to ask that you review your prioritised mapping polygons, make changes to polygons that need updating, or are no longer valid, and review the priority assigned. Please also add new polygons for areas that have been identified as priority areas by you or your organisation.

The process of revising an area of interest is relatively simple and is conducted through the SCT on the AusSeabed website. The link to the SCT User Guide is under the Query (?) icon on the upper right side of the Survey Coordination Tool page. Instructions for revising a polygon can be found on page 28 of the user guide.

If an area of interest has been covered by another organisation, we encourage you to submit your own polygon for that same area. We ask that updates are finalised by **end of February 2023**. Please reach out if you'd like help in updating your polygons or have additional questions.



National Areas of Interest submitted to the Survey Coordination Tool are available to view on the Data Portal.

Extending mapping efforts along southwest Victoria

Deakin University's Marine Mapping Group has recently received funding to continue their mapping efforts in the state of Victoria. This funding was provided by the state government Department of Energy, Environment and Climate Action and industry partner Garmin and will be used to extend mapping and continue filling in gaps in state waters along the southwest coast of Victoria between Port Fairy and the South Australian border (Fig 1). The team will be using their research vessel Yolla, which is based in Warrnambool and outfitted with a Kongsberg 2040c sonar system. Yolla is one of the most sustainable and economical seabed mapping vessels in Australia and, as a trailerable vessel, can be transported and launched from strategic ports across the state.

The data collected in this campaign will extend the seafloor mapping coverage from the Victorian Coastal Monitoring Program to continue to advance our understanding of the offshore sediment supply needed for the beaches. It will also be used to assess how the changing climatology and resultant changes in the wave conditions are impacting the coastlines in the region. Additionally, these maps will help to improve conservation planning, fisheries management, and infrastructure planning to limit impacts on the environment. Previous mapping discoveries have included unknown 'gardens' of magnificently coloured sponges, seaweed forests, seagrass meadows, shipwrecks, the Tyrendarra lava flow extending out from the shoreline, and submerged river systems and lagoons that would have supported Indigenous communities at lower sea levels. For some areas, this is the first information that has been obtained since Matthew Flinders took depth readings from his boat, the Investigator, in 1803.

Once collected these data will be published on AusSeabed and also supplied to Garmin to integrate into Garmin Navionics where users can view the structure of the seafloor they are navigating over (Fig 2).

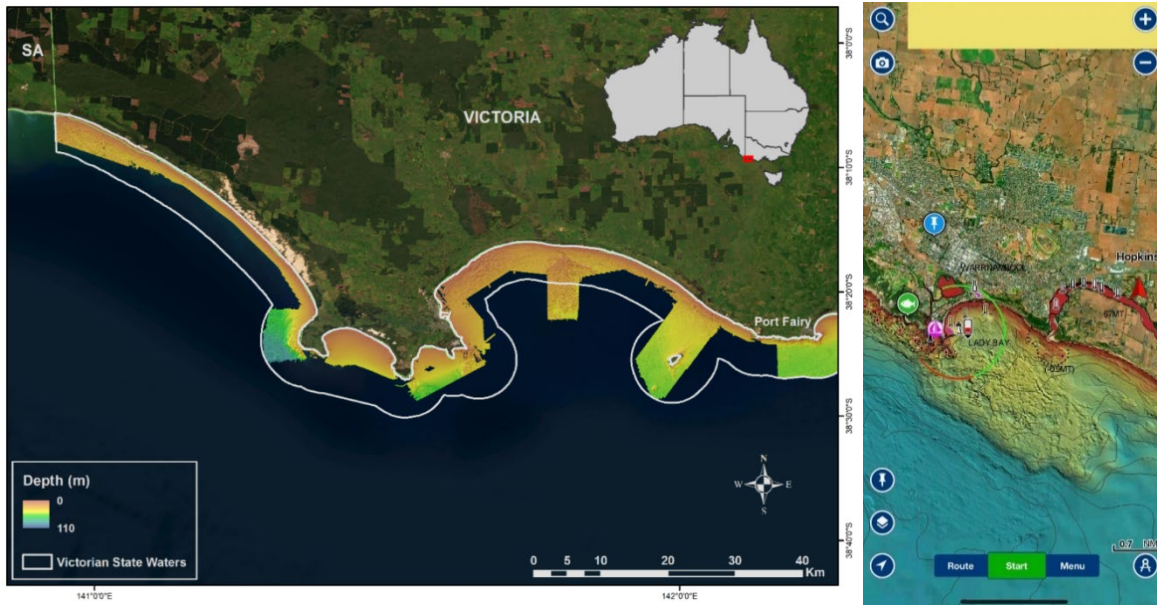


Figure. (left) Mapping area along Southwest Victoria. The existing bathymetry is shown in shaded relief and coloured by depth. The remaining gaps to be filled are those areas between the existing bathymetry and the state waters limit. (right) Screenshot of the seafloor data off Warrnambool in the Garmin Navionics application.

Big Ships with big anchors and big chains: Improving management of anchor impacts for sea going commercial vessels

Tim Ingleton and Matt Rees

Historically, ships dropping anchor and waiting to enter Port Kembla, offshore of Wollongong, had assumed that the seabed was largely sediment. The presence of deeper reefs offshore, however, has been known by local fishers for some time and early multibeam surveys (2006) confirmed the presence of reefs out into deeper water (<90m). For many years the anchor roadstead remained unmapped, and although ports are managed by the state, anchoring was predominantly occurring in commonwealth waters. Only recently was it identified as a priority knowledge gap and a potential risk to biodiversity as part of NSW's Marine Estate Management Strategy.

To understand the distribution of reef and other habitats, the New South Wales Department of Planning and Environment, the University of Wollongong, and NSW Primary Industries (Fisheries) have been surveying since 2014 using a combination of multibeam, sediment sampling and video techniques to map the anchorage roadstead. More recently, they have been working with Ports Authority and Transport for NSW to develop a new anchoring management approach. Two of the group's recently published papers have been key in

supporting improved marine biodiversity outcomes within the Hawkesbury Shelf Marine Bioregion.

Davis et al was published late in 2022 as part of a special issue focused on 'Mapping for Management' and it demonstrated how habitat mapping is key to support improvements in commercial ship anchoring practices worldwide. With the expansion of maritime trade and cruise ship industry, the international shipping fleet is expected to grow substantially in coming decades. And greater marine traffic means greater potential numbers of vessels dropping anchor to await port entry. Many of the worlds international ports have little to no mapping coverage, and knowledge of the benthic ecosystems within their anchor roadsteads is currently poor and the issue inadequately managed. The Davis et. al. paper off Wollongong, demonstrated how habitat mapping is key baseline information critical for understanding habitat distribution. Secondly, it showed how, by using Automated Identification System (AIS) data to map anchor activity, combined with seabed maps, we can then target, monitor and improve anchorage management. For the Gulf of Suez, mapping coverage is relatively poor and when the Evergiven was grounded in 2020, it blocked the Suez Canal and forced hundreds of ships to drop anchor across large areas within the gulf. Even when areas are mapped, however, international crises such as COVID can have unintended consequences. As the pandemic hit the Caribbean, many cruise companies were forced to shut down and politicians in some Caribbean countries allowed ships to drop anchor in previously unanchored areas. Despite comprehensive mapping, political will and co-ordination across multiple agencies and disciplines is required to reduce anchor impacts and improve biodiversity outcomes. doi:10.1016/j.scitotenv.2022.160717

The second paper Broad et. al. (2023) was driven by University of Wollongong PhD Candidate Allison Broad who also used the habitat maps and AIS to select anchored and unanchored locations to test for anchoring impacts on reef biota. Using stereo-imagery captured using a Remotely Operated Vehicle (ROV), a suite of benthic taxa was scored then analysed to quantitatively compare abundance and diversity between treatments. Allison found a 3-fold and 7-fold decline in morphotype richness and relative abundance of benthic taxa in anchored locations. There was also a marked shift in community structure observed. Only for the Bryzoans, was there no difference. The work is key to provide a baseline for future ecological surveys to monitor ecosystem change and recovery. doi:10.1016/j.csr.2022.104834

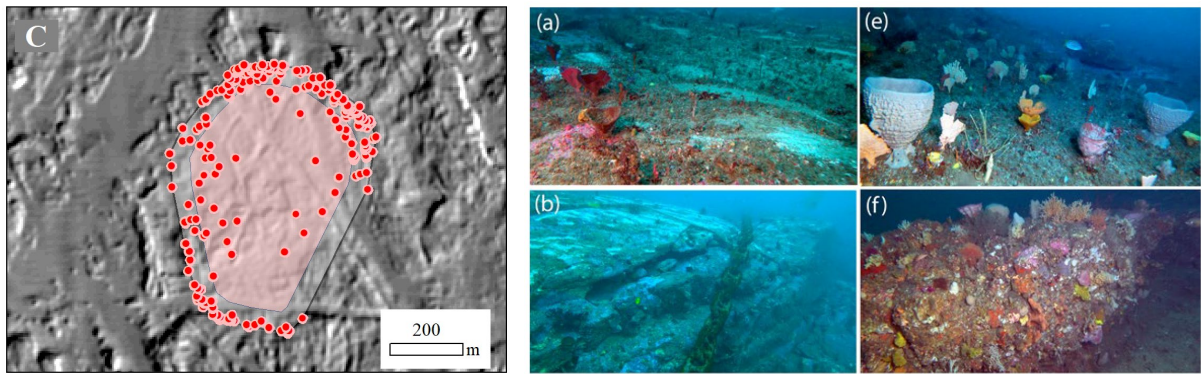


Figure 1a). Anchor-circle identified using AIS over hill-shaded MB bathymetry, Wollongong in Davis et. al, 2021; b) Imagery from anchored (left) versus unanchored (right) from Broad et al 2023.

Transit mapping across the Great Southern Ocean; geomorphic insights

The CSIRO research vessel (RV) *Investigator* is southbound on a 47 days voyage led by Geoscience Australia (IN2023_V01) to investigate Antarctic Bottom Water (AABW), which plays a critical role in ocean circulation. Chief Scientist Dr Alix Post and her multi-disciplinary team will collect and analyse seafloor sediment samples, water chemistry and geophysical data to investigate past changes in AABW to help predict how a warming climate will impact future ocean circulation.

The 8000 km transit across the Southern Ocean from Fremantle (Western Australia) to our survey area off Cape Darnley (East Antarctica) will take 12 days and will track over one of the deepest and least mapped regions of the global oceans. Bathymetric transit data will contribute to both the national AusSeabed and international GEBCO Seabed 2030 collaborative seabed mapping initiatives to help “map the gaps”. Already, by day 11 of transit, the 7000 km long swath of new, high-resolution multibeam had revealed several new seamounts and detailed the rocky surface complexity of the Diamantina Fracture Zone and Southeast Indian Ridge at depths up to 6 km.

Sub-bottom data are also being collected during the *Investigator*'s transit and these data are supporting more conclusive geomorphic interpretations. Sub-bottom images reveal that many of the larger ridges are comprised entirely of rock, whereas others are draped in tens of meters of sediment that thicken laterally to fill intervening basins. Elsewhere along the route, relatively featureless planar surfaces are revealed by the sub-bottom images to be underlain

by thick accretionary barforms that have more recently been buried by overlying, interbedded planar deposits (see figure below).

These geomorphic insights are useful for a range of marine sub-disciplines (e.g. benthic habitat mapping, seafloor stability analyses), and can be used to infer temporal variations in the strength of deep ocean currents, current pathways, rates of sediment supply and climate drivers. Similarly thick sediment drifts in the Cape Darnley field area will be characterised using high-resolution bathymetric grids and sub-bottom images to locate ideal sites to collect sediment cores. These cores are expected to have recorded hundreds of thousands of years of sediment accumulation and will be analysed to determine changes in palaeo-geomorphic processes as well as AABW behaviours in relation to glacial and interglacial climates.

More information about the voyage is available here: <https://www.ga.gov.au/news-events/news/latest-news/voyage-of-discovery-to-the-east-antarctic-margin>

Rachel Nanson and Aero Leplastrier, Geoscience Australia

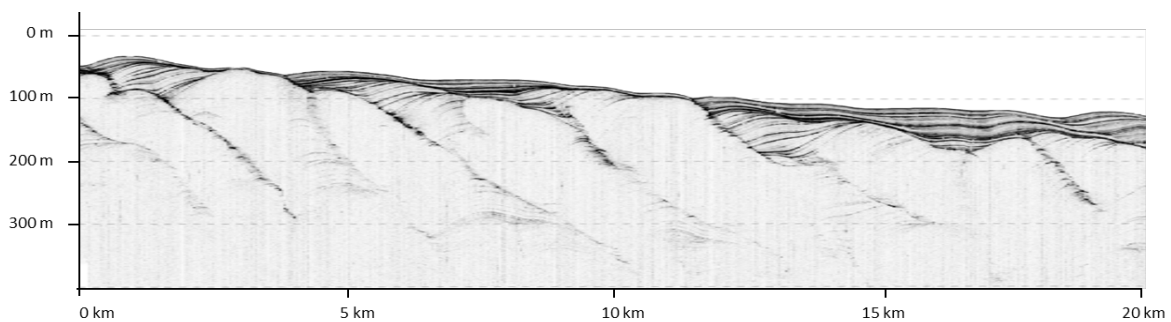


Figure: Even at transit speed, the sub-bottom profiles capture images of hundreds of meters of sediment (Image supplied by the RV *Investigator*'s geophysical team: Francisco Navidad and Amy Nau).

New bathymetry compilation from seismic data

Over the past year, the University of Western Australia, Norwegian Geotechnical Institute, UniLasalle and Geoscience Australia have been working together on a project to turn archived 3D seismic data into bathymetric compilations.

These datasets can assist with enabling large scale seabed analyses across currently data-poor tracts of seafloor. The second to roll-out is the Gippsland basin bathymetry compilation which will provide significantly more bathymetric coverage to the Bass Strait at 30 m resolution. [The grids have now been published on the AusSeabed data portal.](#)

For more on the methods used see: Lebec, U., Paumard, V., O'Leary, M. J., and Lang, S. C., 2021, Towards a regional high-resolution bathymetry of the North West Shelf of Australia based on Sentinel-2 satellite images, 3D seismic surveys, and historical datasets: Earth System Science Data, v. 13, no. 11, p. 5191-5212 <https://doi.org/10.5194/essd-13-5191-2021>, 2021.

Empowering Women in Hydrography in the Southwest Pacific Hydrographic Commission

The SWPHC is excited to build a network of Women in Hydrography across the region to share information on the IHO Empowering Women in Hydrography initiative, build relationships and support career growth through mentoring, opportunity, and awareness. Initially the group will be managed via email correspondence and virtual meetings or workshops. Please encourage female colleagues involved in hydrographic surveying, cartography or maritime safety administration to join the network by forwarding their name and email address to hilary.thompson@defence.gov.au who will facilitate the network.

The network so far has 54 women from Hydrographic Offices, Navy, Industry, Academia and Maritime Administrations and would love to have you on-board

Australian Hydrographic Society Education Award

The Australasian Hydrographic Society (AHS) is pleased to announce that applications will soon be accepted for the Society's 2023 Education Award. The details of the award are attached in a letter, poster and application form.

The \$3,500AUD award is provided to a student whose study - in the opinion of the Award Panel - best promotes hydrography and related sciences and best recognises the efforts of the student involved in the study of hydrography and related sciences.

Applications close 31 March. Further information can be found at the AHS website:

<http://www.ahs.asn.au/Education.html>.

Reading corner

Grab a cuppa and have a read of some new relevant material published in the community. This week immerse yourself in the exciting work AusSeabed-ers are having in Antarctic Waters:

- [Photos from the field: our voyage investigating Australia's submarine landslides and deep-marine canyons](#)
- Hear from voyagers in a [podcast series](#)
- [Voyage of discovery to the East Antarctic margin](#)
- [Getting to the bottom of Antarctic Bottom Water](#)

Also check out the live streams from [a series on data discovery and access](#) by the GEBCO Technical Subcommittee on Ocean Mapping (TSCOM) and the IHO Data Center for Digital Bathymetry (DCDB).

Upcoming Events

Stay up-to date on upcoming events [via the AusSeabed website](#). Please contact us if we have missed any, or you are running events or workshops that you would like to make the community aware of.

AusSeabed Quarterly Showcase: 17th April 2023

Our quarterly showcases provide a chance for us to show the AusSeabed community what we have been working on in the last quarter and reflect on what was. Based on our progress we offer the community our goals for the next quarter against our project objectives. The **next AusSeabed Quarterly Showcase will be held on the 17th of April at 11am AEDT.**

AusSeabed Community Webinars: 23rd March 2023

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World Hydrography Day 2023 + AusSeabed Annual Workshops: 21 June, Wollongong NSW

We invite you to join the Australian Hydrographic Office and SSSI for a HydroScheme Industry Partnership Program (HIPP) Seminar taking place on World Hydrography Day. The day was adopted by the International Hydrographic Organization as an annual celebration to publicise the work of hydrographers and the importance of hydrography.

This seminar is a chance for hydrographic professionals to hear from great speakers, network with colleagues old and new and receive six all-important CPD points. A meet and greet dinner will also be held the evening before at Steamer's Bar and Grill.

The program will be released in March, but mark your diaries now for this not to be missed event on the hydrographic surveying calendar! See more information [here](#).

Australian Hydrographic Society Webinars and Networking: 30 March, Perth

Join the AusSeabed Steering Committee and the AHS for 2 hours of webinars at Curtin University followed by social networking. Webinars will be from 3-5pm and social networking will commence at 6pm at the Broken Hill Hotel, Victoria Park.

GEBCO Webinar Series on Improving discovery and access to bathy data: 27 Feb, Virtual

The GEBCO Technical Subcommittee on Ocean Mapping (TSCOM) and the IHO Data Center for Digital Bathymetry (DCDB) are pleased to invite you to a series of five listening sessions based around complementary steps of the bathymetric data life cycle. These webinars (to be held the week of 27 February 2023) will provide an opportunity for leaders in the field to present on their approaches towards the development and maturation of new and emerging technologies to acquire, manage, visualize, discover and access bathymetric data. The intended outcome of this virtual series is to understand the current state of affairs and planned developments that can be coordinated, shared and utilized by members of the international mapping community in support of local and regional mapping efforts and the global Nippon Foundation-GEBCO Seabed 2030 Project. The themes of the four listening sessions include Data Stewardship, Data Discovery, Data Access & Dissemination, Data Processing & Transformation.

We hope to see you there! See more information [here](#).

Association of Public Authority Surveyors Conference 2023: 20-22 March, Coffs Harbour NSW

APAS hosts an annual conference in the first half of each calendar year which is open to both members and non-members. The conference incorporates a theme each year and traditionally covers a wide range of topics relevant to the surveying and spatial information community. The 2023 theme is "Pirates of the Cadastre". Submissions close on Friday, 23 September 2022. See more information [here](#).

EGU Annual Meeting 2023: 23-28 April, Vienna Austria

The General Assembly 2023 of the European Geosciences Union (EGU) will take place 23-28 April 2023 in Vienna, Austria.

The purpose of the EGU General Assembly 2023 will bring together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary and space sciences. It aims to provide a forum where scientists, especially early career researchers, can present their work and discuss their ideas with experts in all fields of geoscience. See more information [here](#).

GeoHab 2023: 8-12 May, La Réunion island

The GeoHab 2022 annual conference will be held in La Réunion Island (Indian Ocean) from May 8 to 12th 2023. Abstract submissions open on December 1st. See more information [here](#).

Locate 2023: 10-12 May, Adelaide SA

Each year, the Locate conference attracts national and international delegates from within and outside the spatial & surveying industry. As Australia's premier spatial & surveying conference, Locate provides guests with a unique opportunity to learn about the latest trends and applications in geospatial technologies. See more information [here](#).

AMSA 2023: July 2-7, Gold Coast QLD

Don't miss the AMSA 2023 Conference, where marine scientists will come together to advance our understanding of Australia's unique marine environment.

The 'Science in Sea Country' theme supports AMSA's recognition of the enduring connection that Aboriginal and Torres Strait Islander People have with their Sea Countries, and acknowledges the critical role that the ecological and cultural knowledge of Australia's first scientists plays in the sustainability of our seas. See more information [here](#).

SOOS Symposium 2023: 14-18 Aug, Hobart TAS

The [first Southern Ocean Observing System \(SOOS\) Symposium](#) will be held from 14-18 August 2023 in Hobart, Tasmania. It is our pleasure to invite you to this milestone event for the SOOS community.

The SOOS Symposium theme, "Southern Ocean in a Changing World", recognizes the important role of the Southern Ocean in the Earth system. The Symposium is a forum for assessing our progress so far in providing observing systems, observations and regional programs that deliver timely and accessible information for the Southern Ocean. The Symposium is also an opportunity to address the challenges faced in providing long term observations that address policy and societal issues as well as advancing our scientific understanding of the Southern Ocean. See more information [here](#).

Share your work with the AusSeabed community

Finally, a reminder as always that anyone with an interest in AusSeabed can sign up to the newsletter mailing list on our website, where you can also check out past issues. And please send any items for the next newsletter to AusSeabed@ga.gov.au